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THE following communications were read :—

I. Account of an Observatory constructed at the Mauritius, by Captain J. A. Lloyd. Communicated by Sir J. Herschel.

Captain Lloyd was appointed surveyor-general in the Mauritius, March 1831, and was furnished with an altitude and azimuth circle by Ramsden, a pendulum, a variation transit, a dipping needle, and a watch chronometer belonging to the government, by the recommendation of the Royal Society. Feeling convinced that the island, from climate and locality, was peculiarly well adapted for astronomical purposes, he obtained from the local government a temporary grant of an old round tower at the southern side of Port Louis, together with some assistance in the necessary constructions. In this building, which he has called “Beaufort Tower,” he has erected several instruments, and made a considerable number of astronomical and meteorological observations. We shall proceed to give some account of his station, as well as it can be done without the plans, which are distinctly and beautifully drawn, and have been forwarded with the written description.

The ground is hard coral, and the building is of the same material, cemented with lime imported from France by the first governor, M. la Bourdonnaye. The walls are three feet nine inches thick at the bottom, and two feet six inches at the upper story, inclosed in a square by a high wall about two feet thick and eight feet high on the south and west sides, and by a dwarf wall of about four feet on the two other sides. There are two stories besides the ground floor. On the main wall, at the top, is constructed a turret of solid masonry with a revolving roof, the whole supported by corbels let into the thickness of the wall, and the floor formed by three blocks of stone, about fourteen inches thick, and of the same diameter (nine feet) as the tower, laid so as to be nearly balanced on the main wall. The ground floor is appropriated to meteorological apparatus and observations, and also to the chronometers, of which Captain Lloyd states (in an accompanying letter to Sir J. Herschel) that he has generally from fifteen to thirty, belonging to the shipping in the harbour. An eight-day time-keeper, seen through a glass from the outside of the building, serves for the accommodation of the public. All the fittings in this room are, as much as possible, of copper. The first floor is used as a computing

room, and contains the iron windlass used in raising the trap opening in the upper floor. Its effect on the magnetic instruments below, if any, has not been yet discovered. The second and highest story (the turret excepted) is the transit-room. The transit piers are built into the wall and floor (the latter being a solid stone projection from the wall for about a third part of the diameter of the room), and may, perhaps, be best described as having the form of *inverted buttresses*.

“ In the northern of these piers stands an admirable 46-inch transit by Troughton and Simms, and in the southern another of the same focal length by Carey, each capable of observing from the horizon on the north to eight degrees below the south pole; and I am most happy to say that it is now nearly five months since I had occasion to adjust it in the least, although examined every day with a very delicate and large hanging level, two feet in length, by Troughton, which, however, from the large quantity of brass about it, constantly varies in its own adjustment, which, however, is of no consequence, it being always reversed several times, and the divisions read each way. It is, however, very delicate; but the stability of the building is such, that the carts passing a road some little distance from it have no effect on the level, although the caulking of a ship in the harbour near the tower, in wet or gloomy weather, sensibly affects the instrument while observing with a high magnifying power; and the morning and evening gun causes a very considerable tremor in the level. The meridional correctness of the instrument is examined almost every three or four days by stars differing at least 60 degrees in their declination.

“ There are also two meridian marks: one to the north, a very large block of stone placed on the opposite side of the harbour; and to the south, up the face of the mountain, at an altitude of about 8 degrees, and 7300 feet distant, is a face blasted out of the solid part of the mountain, about six feet in length and three high, on which is painted a white ground with a black diagonal scale reversed, which I have found highly useful, particularly as the two instruments not being by two inches in the same plane, one meridian mark would not answer for both. It affords also another convenience for adjusting either of the instruments, and detecting at once any error, either in collimation, meridian, or axis, by two modes; for if the two instruments are adjusted to their meridian mark, and, upon looking one into the other, the middle wires do not correspond, it at once shews (if the meridian marks be correct) that there is an error either in collimation or axis; and *vice versa*, if one instrument be correctly levelled, it may be immediately brought into the meridian, and its collimation adjusted, even at night, by placing a lamp behind the eye-end of the transit, and bringing it to the middle wire of the other; and in the same manner I adjust my variation transit to the meridian, by looking up into the Troughton transit, the wires of which I can distinctly see through the telescope of the variation transit, and for which purpose there are openings in each floor, closed by traps and hinges.”

The other instruments are as follow, viz. :

“ An excellent astronomical clock by Parkinson and Frodsham, with a hole cut through the glass plate in front a little larger than the white disc on the pendulum within, and another for winding up the clock without opening the case. There being so little change in the barometer here, it was, of course, easy, with care, to place the exact quantity of mercury in the pendulum necessary to compensate it delicately, and its rate has for months never exceeded $+0^s.5$, excepting on one occasion, when several salutes were fired at the same time nearly, from the Melville and other large ships of war, and the land batteries and gun-boats close by practising, when the clock's rate changed very materially, to some seconds losing, and maintained its rate until altered by me. I have no doubt it was occasioned by the severe concussions, which caused the pendulum to shake into its support more firmly. The transit never altered in the least, although the concussions of several heavy pieces of ordnance at once made the level vibrate, so as to cause me much alarm for its safety.

“ An invariable pendulum, No. 7, used by Captain Sabine, and, I believe, afterwards by Professor Airy, when it received considerable damage, but which was effectually repaired by Mr. Jones; the accident has had no mischievous effect but to render nugatory the valuable observations made with it by Capt. Sabine, in comparison with those made by me since.

“ A contrivance has been made for indicating the correct time to the ships in the harbour. A lever has been constructed which supports a heavy slide, the working of which may be seen in the drawings. This slide, when down, is supported by a T formed of a very strong spar resting on the solid coral beneath, in order to prevent concussion when falling, and covers a large black sphere. Twice a-week, at about twelve o'clock, a flag is hoisted, and the slide hauled up from the inside, and the lever pushed out so as just to support the edge of the slide: at $1\frac{1}{4}$ beats of a pocket chronometer, equal to 5-10ths of a second before one o'clock, mean time, the lever is smartly struck on a round plate for the purpose, and the slide immediately hides the ball. This period of time is the exact quantity the slide takes to entirely cover the black disc from the moment it is struck inside, and which was determined by a mean of several trials.

“ The tower being all white, and even the windows whitened, at a distance of four miles the black disc is easily discerned as a beautifully clear spot on a large white ground; and the disappearance of the spot is so apparently instantaneous at that distance, that it has almost a magical effect.

“ It only remains to describe the argamasse roof and turret. The roof is covered with a very thick layer of argamasse, that is, broken brick and cement, covered with bitumen, and the edges along the trap well leaded, to prevent any leakage from rains.

“ The roof of the turret is made of very thick teak, and revolving

on three wooden balls, and copied exactly from Pearson's drawing in his *Practical Astronomy*.

" A rain-gauge, permanently fixed.

" The solid stone pedestal supports a large astronomical circle, by Ramsden, which lay many years at the royal observatory; and, although not of very late construction, is an admirable instrument, and, with an additional level, mounted by Mr. Carey, is sufficient for the purpose required."

II. Mr. Babbage, in a letter to Mr. Baily, suggests the application of a camera lucida to a telescope mounted equatorially, and governed by a clock; the images of groups of stars or of spots on the moon's disc, to be thrown on a varnished plate of copper, and traced with a steel point: the maps thus obtained to be etched. Mr. Babbage thinks, from some experiments formerly made by him, that there would be no great difficulty, and hopes that the attempt will be made by some person possessing means and leisure.

III. Sir John Herschel, in a letter to Mr. Baily dated Feb. 3, 1836, states that the comet keeps him up "*all night and every night*." He further observes: " It is altogether the most beautiful thing I ever saw in a telescope. The most surprising thing about it, however, is the *enormous* increase of its dimensions within the last week, being now more than triple the diameter which it had on the 20th ult., when I first observed it. A few days ago it threw out two feeble tails; it has none now."

IV. On the Instruments used by Dr. Halley at Greenwich, by Professor Rigaud. An abstract of this paper (the reading of which is not yet finished), will appear next month.

V. Stars observed with the Moon at the Observatories of Greenwich and Edinburgh, in the month of March, 1836.

Day.	Object.	Apparent R.A. from Observation, Greenwich.			True Sidereal Time, Edinburgh.		
		h	m	s	h	m	s
Mar. 2	γ Leonis	...	...	...	10	10	56,28
	ϵ Leonis	...	...	...	10	24	11,27
	Moon 1 L.....	...	...	...	10	43	18,52
	n Leonis	...	...	...	11	7	17,81
	r Leonis	...	...	...	11	15	23,30
3	n Leonis.....	...	...	...	11	7	17,99
	r Leonis	...	...	...	11	15	23,22
	Moon 2 L	...	...	...	11	36	27,81
	σ Virginis	...	...	...	11	56	52,06
	η Virginis	...	...	...	12	11	31,82
5	δ Virginis	12	47	21,60	...	...	...
	θ Virginis	13	1	28,69	...	...	...
	Moon 2 L.	13	17	35,72	...	...	...
	m Virginis	13	33	1,44	...	...	...
6	Moon 2 L.....	14	10	19,29	...	...	...
	ξ^2 Libræ	14	47	53,25	...	...	...